

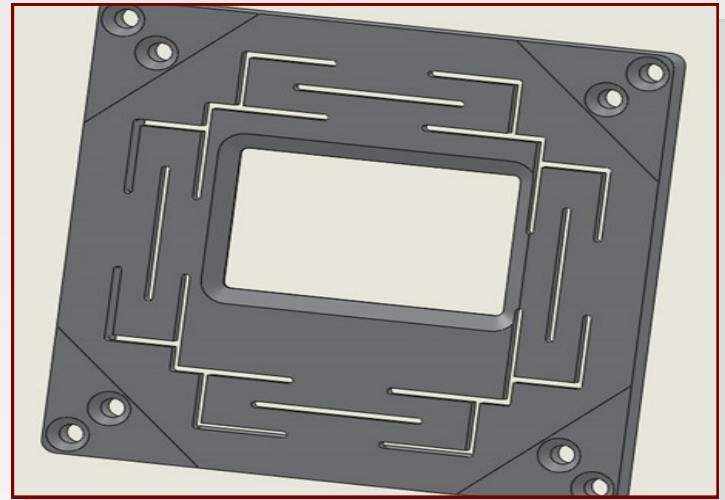


## TECHNOLOGY SUMMARY

US PATENT PENDING

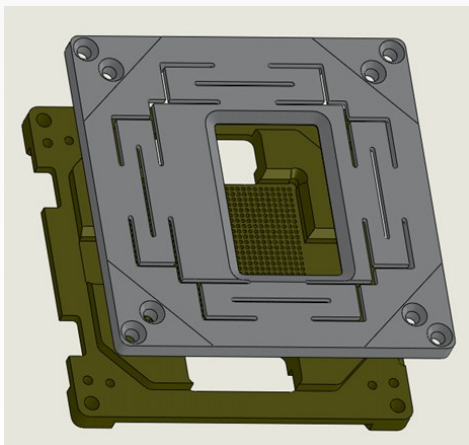
Sandia National Laboratories has developed a low profile, controlled force, minimal torque push plate for ball grid array multi-chip module (MCM) test sockets.

The ball grid array (BGA) is an enabling technology for multi-chip modules, a significant improvement over pin grid arrays. Traditional pin grid array technology suffers from physical limitations; as package pins get closer together, the risk of accidentally bridging adjacent pins with solder increases. In a BGA, the pins are replaced by balls of solder on the bottom of the multi-chip module. The solder balls are melted to a printed circuit board and surface tension maintains the necessary alignment while the solder cools and ultimately solidifies. Before melting the solder balls, test sockets are used to probe the MCM, allowing testing and troubleshooting, but current test sockets are not always reliable.

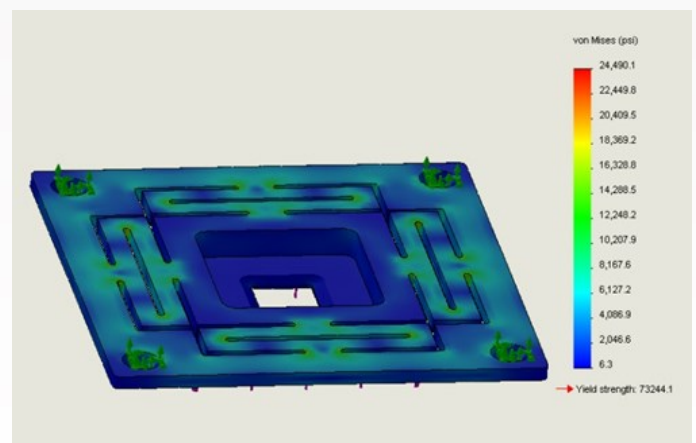


Cantilever Push Plate

Sandia National Laboratories has invented a superior push plate to address the shortcomings of current BGA socket clamping methods. Existing methods to clamp the MCM to these temporary sockets are unreliable and block access to the module. Sandia's superior push plate incorporates cantilevers to provide stiffness, allowing a uniform, calibrated downward force and minimizing torque while providing access to the MCM components. This is achieved both by minimizing thickness and moving the mechanism responsible for the down force (the cantilevers) to the perimeter area outside the area of the MCM.



Push plate with Multi chip module (MCM) holder



Stress Analysis



## POTENTIAL APPLICATIONS

Microelectronics

Semiconductor Manufacturing

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## TECHNOLOGICAL BENEFITS

Provides a known down force

Minimizes torques

Does not interfere with access to the top of the MCM

Has minimum thickness

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## TECHNOLOGY READINESS LEVEL

Sandia estimates this technology to have a technology readiness level of approximately 6.  
The technology has been demonstrated as a prototype.

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## CONTACT INFORMATION

For more information or to discuss licensing opportunities contact us at

**[ip@sandia.gov](mailto:ip@sandia.gov)**.

*Refer to SD # 12125*

Or to learn more, please visit our website at

**<https://ip.sandia.gov>**.